Twin Cities Campus

Data Science Certificate

Computer Science and Engineering Administration

College of Science and Engineering

Link to a list of faculty for this program.

Contact Information:
Data Science Graduate Program, Department of Computer Science and Engineering, University of Minnesota, 4-192 Keller Hall, 200 Union Street S.E., Minneapolis, MN 55455 (612- 625-4002; fax: 612-625-0572).
Email: datascience@umn.edu
Website: http://datascience.umn.edu

- Program Type: Post-baccalaureate credit certificate/licensure/endorsement
- Requirements for this program are current for Fall 2020
- Length of program in credits: 12
- This program does not require summer semesters for timely completion.

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The Data Science Certificate program provides a strong foundation in the science of Big Data and its analysis by gathering in a single program the knowledge, expertise, and educational assets in data collection and management, data analytics, scalable data-driven pattern discovery, and the fundamental concepts behind these methods.

Students who graduate from this 2-semester certificate program will learn the state-of-the-art methods for treating Big Data and be exposed to the cutting edge methods and theory forming the basis for the next generation of Big Data technology.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)
- partially online (between 50% to 80% of instruction is online)

Prerequisites for Admission

The preferred undergraduate GPA for admittance to the program is 3.00.

A bachelor's degree from an accredited college or university in computer science, math, statistics, engineering, natural sciences, or a related field.

Other requirements to be completed before admission:
The undergraduate degree must include statistics, calculus, multivariable calculus, linear algebra, and mathematical software environments such as Matlab or R or the equivalent, programming languages such as C+, C++, Java, programming experience including algorithms and data structures normally taught in beginning computer science courses either as part of the undergraduate degree or subsequent work experience.

Special Application Requirements:
Admission application deadlines: rolling. Applicants are considered for Fall or Spring admission and decisions are made after all applications are received following the close of the application cycle.

International applicants must submit score(s) from one of the following tests:

- TOEFL
  - Internet Based - Writing Score: 23
  - Internet Based - Reading Score: 23
- IELTS
  - Total Score: 6.5
- MELAB
  - Part 1 (Composition) score: 80

Key to test abbreviations(TOEFL, IELTS, MELAB).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

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Program Requirements

Use of 4xxx courses towards program requirements is not permitted.

A minimum GPA of 3.0 is required for students to remain in good standing.

The Data Science certificate requires a minimum of 12 credits consisting of one course from each of the three emphasis areas, plus one course chosen from any of the three emphasis areas.

Courses must be taken on the A/F grading scale with a minimum grade of B-.

Algorithmics (3-6 credits)

Select at least 3 credits from the following:

CSCI 5521 - Machine Learning Fundamentals (3.0 cr)
CSCI 5523 - Introduction to Data Mining (3.0 cr)
CSCI 5525 - Machine Learning: Analysis and Methods (3.0 cr)
EE 8591 - Predictive Learning from Data (3.0 cr)
PUBH 7475 - Statistical Learning and Data Mining (3.0 cr)

Statistics (3-6 credits)

Select at least 3 credits from the following:

PUBH 7402 - Biostatistics Modeling and Methods (4.0 cr)
PUBH 7440 - Introduction to Bayesian Analysis (3.0 cr)
STAT 5102 - Theory of Statistics II (4.0 cr)
STAT 5302 - Applied Regression Analysis (4.0 cr)
STAT 5401 - Applied Multivariate Methods (3.0 cr)
STAT 5511 - Time Series Analysis (3.0 cr)
STAT 8051 - Advanced Regression Techniques: linear, nonlinear and nonparametric methods (3.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)

Infrastructure and Large Scale Computing (3-6 credits)

Select at least 3 credits from the following:

CSCI 5105 - Introduction to Distributed Systems (3.0 cr)
CSCI 5451 - Introduction to Parallel Computing: Architectures, Algorithms, and Programming (3.0 cr)
CSCI 5707 - Principles of Database Systems (3.0 cr)
CSCI 8980 - Special Advanced Topics in Computer Science (1.0 - 3.0 cr)
EE 5351 - Applied Parallel Programming (3.0 cr)
CSCI 8205 - Parallel Computer Organization (3.0 cr)
or EE 8367 - Parallel Computer Organization (3.0 cr)

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